

# Results



April 2003

**A** primary goal of the USAID-funded LINKAGES Project during its first five years (1996-2001) was to demonstrate in several countries an increase in optimal feeding practices among infants within a relatively short period of time (20–24 months) and at a scale that could achieve significant public health impact. LINKAGES supported the design and implementation of national-level advocacy, district-level programming, community-based counseling, and support groups to achieve measurable improvements in infant feeding behavior. Based on scientific evidence of the benefits of optimal feeding practices for child survival, growth, and development, LINKAGES focused on the following objectives:

- ◆ Increase the timely initiation of breastfeeding rate (within the first hour of birth)
- ◆ Increase the exclusive breastfeeding rate of infants less than six months of age
- ◆ Improve the lactational amenorrhea method (LAM) rate as a proxy for expanding the offering of LAM
- ◆ Reduce the mixed feeding rate among young infants in communities affected by HIV
- ◆ Increase the timely complementary feeding rate of infants 6– < 10 months

This issue of *Experience LINKAGES* reports on the project's indicators and tools for measuring change, the results achieved, and lessons learned in collecting infant feeding data. For a description of LINKAGES' strategy for achieving results, see *Experience LINKAGES: Program Approaches*. The publication series *World LINKAGES* describes specific interventions used in each country.

## Behaviors and Their Indicators

LINKAGES uses a common set of breastfeeding and infant feeding indicators based on WHO definitions (1991) and Wellstart International's toolkit for monitoring and evaluating breastfeeding activities (1996). These standard indicators have all been field tested prior to application. They are limited in number and fairly easy to both measure and interpret. This strong monitoring and evaluation base, with its clearly articu-

lated indicators to measure progress in achieving results, set the direction for the project.

### Increase timely initiation of breastfeeding (within one hour of birth)

Approximately one-fourth to one-half of infant deaths in developing countries occur in the first week of life. Exclusive and immediate breastfeeding—within the first hour—will improve the health and survival of newborns. In many developing countries initiation of breastfeeding is delayed by hours if not days. Early initiation provides newborns with high levels of antibodies, vitamin A, and other protective factors through colostrum, the sticky, yellow-white early milk. Skin-to-skin contact during breastfeeding stabilizes the baby's temperature, respiratory rate, and blood sugar level.

#### Timely Initiation of Breastfeeding (TIBF)

**Rate:** the percentage of infants less than 12 months of age who are put to the breast within one hour of birth. The rate is calculated as follows:

$$\frac{\text{\# of infants 0– < 12 months put to the breast within one hour of birth}}{\text{total \# of infants 0– < 12 months}} \times 100$$

### Increase exclusive breastfeeding among infants less than six months

Breastmilk provides all the energy, nutrients, and water that an infant needs during the first six months. Exclusive breastfeeding reduces infant deaths caused by common childhood illnesses such as diarrhea and pneumonia, hastens recovery during illness, and helps space births. Survey data in 1999 from 43 countries indicated that less than half (48 percent) of infants 0– < 4 months of age were exclusively breastfed in the previous 24 hours. Increasing exclusive breastfeeding among infants in this age group as well as those 4–5 months of age is critical.

*Experience LINKAGES is a series of publications on the strategies, tools, and materials used by the LINKAGES Project to achieve results.*

**Exclusive Breastfeeding Rate (EBR):** the percentage of infants less than 6 months old who receive only breastmilk, and no other solids or liquids including water (based on 24-hour dietary recall), with the exception of drops or syrups consisting of vitamin or mineral supplements, and medicines. The rate is calculated as follows:

$$\frac{\text{\# of infants 0- < 6 months exclusively breastfed}}{\text{total \# of infants 0- < 6 months}} \times 100$$

### Expand the offering of the lactational amenorrhea method (LAM)

LAM is a modern contraceptive method based on the natural infertility resulting from full or nearly full breastfeeding in the absence of menses up to six months postpartum. LAM, under typical use, is more than 98 percent effective and contributes to the first six months of birth spacing. Safe and affordable, LAM is also the most effective short-term modern method of contraception available to all women right after delivery. Despite these benefits, LAM is often misunderstood and undervalued by family planning and MCH program planners and service providers. Consequently, many women are not presented with LAM as a family planning option. LINKAGES uses the LAM rate as a proxy for the expanded offering of LAM.

**LAM Rate:** the proportion of eligible women who give birth in a given period of time who consciously and deliberately accept LAM as a modern contraceptive method. The rate is calculated as follows:

$$\frac{\text{\# of women using LAM as a family planning method}}{\text{total \# of women with infants < 6 months}} \times 100$$

### Reduce mixed feeding among young infants in areas of high HIV prevalence

The delicate balance between breastfeeding's life-saving benefits and the risk of HIV transmission via breastfeeding complicates optimal infant feeding in communities affected by HIV. Each mother needs to consider the risks and benefits of various infant feeding options in her situation and assess the affordability, feasibility, acceptability, safety, and sustainability of these options. Existing research suggests that exclusive breastfeeding is safer than mixed feeding (feeding breastmilk and other milks or foods). Yet there is a widespread perception that exclusive breastfeeding is not an achievable goal. Erosion of breastfeeding practices is a serious concern because of the significant impact on child health and survival if breastfeeding were to decline among uninfected mothers.

**Mixed Feeding Rate:** the percentage of infants less than 6 months old who receive, in addition to breastmilk, other foods or liquids including water (based on 24-hour dietary recall). The rate is calculated as follows:

$$\frac{\text{\# of infants 0- < 6 months who receive breastmilk and any other food or liquid}}{\text{total \# of infants 0- < 6 months}} \times 100$$

### Increase timely complementary feeding among infants 6 through 9 months

Rates of malnutrition usually peak between 6–24 months, the time of complementary feeding. During this period other foods or liquids should be provided along with breastmilk. The second half of the first year is an especially vulnerable time because infants are learning to eat and must be fed soft foods frequently and patiently. If their nutritional intake is inadequate, the consequences persist throughout life.

**Timely Complementary Feeding (TCF) Rate:** the percentage of infants 6 through 9 months of age who receive breastmilk and a solid/semi-solid food (based on 24-hour recall). Solid foods are defined as foods of mushy or solid consistency, not fluids. The rate is calculated as follows:

$$\frac{\text{\# of infants 6- < 10 months breastfeeding and receiving solid foods}}{\text{total \# of infants 6- < 10 months}} \times 100$$

## Results

This section reports on the results of LINKAGES surveys in program sites in 2000 and 2001. The table below shows program coverage at the time of the 2001 “rapid assessment” procedure (RAP) surveys. The three key indicators in LINKAGES programs in Mada-

#### Coverage at Time of 2001 RAP\* Surveys

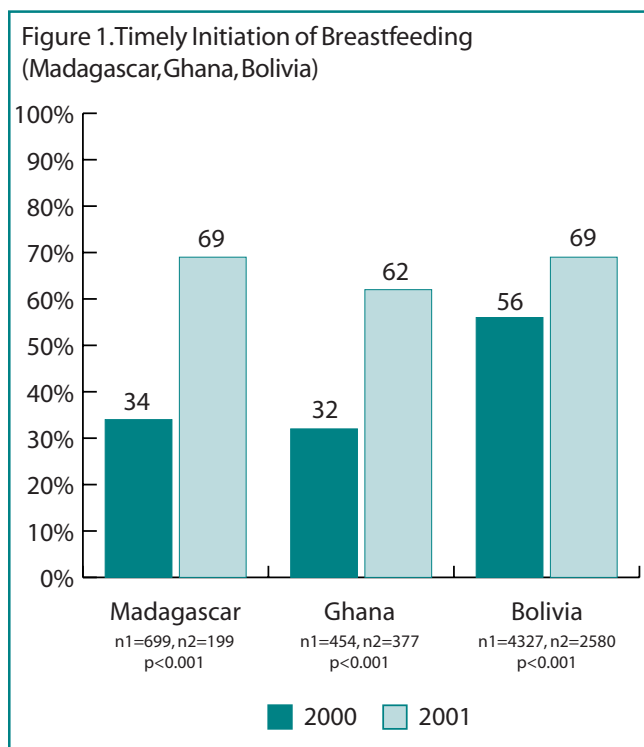
Country Population	Project Catchment Population	Catchment Area
<b>Madagascar</b> 13.3 million	3.2 million	10 districts in 2 of 6 regions
<b>Ghana</b> 18.3 million	500,000	Focal communities in 9 districts in 3 northern regions
<b>Bolivia</b> 7.9 million	1 million	126 districts throughout country

\*Rapid assessment procedure

gascar, Ghana, and Bolivia are timely initiation of breastfeeding, exclusive breastfeeding, and timely complementary feeding. Bolivia, Madagascar, and Jordan also collect data on LAM. In Zambia, a country with high HIV prevalence, LINKAGES reports on mixed feeding. Sample sizes and  $p$  values are presented in the graphs for each indicator.<sup>1</sup>

### The timely initiation of breastfeeding rate (within the first hour) doubled in Madagascar and Ghana and increased by a quarter in Bolivia.

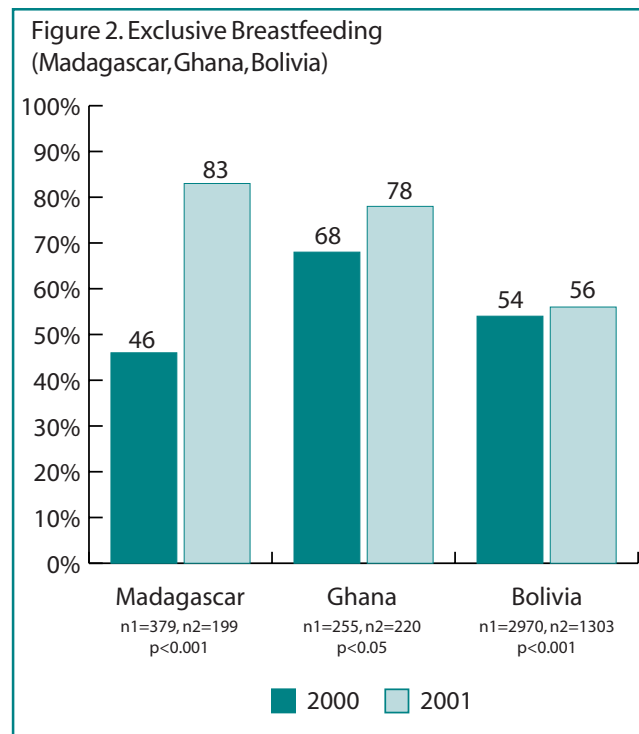
In Madagascar initiation of breastfeeding within the first hour of birth increased over a 21-month period from 34 percent in 2000 to 69 percent in 2001 (figure 1). In Ghana timely initiation increased from 25 percent in the 1998 DHS, to 32 percent in the 2000 RAP and 62 percent in the 2001 RAP. In Bolivia the rate increased from 56 percent at baseline in April 2000 to 69 percent as measured in the October 2001 RAP survey.



<sup>1</sup> In each graph, N1 equals the sample size at LINKAGES survey point 1 and N2 the sample size at survey point 2. The  $p$  values indicate the level at which the results are statistically significant. Results with a  $p$  value less than .05 are considered statistically significant.

### The exclusive breastfeeding rate nearly doubled in Madagascar, increased significantly in Ghana, and showed modest gains in Bolivia.

In Madagascar the exclusive breastfeeding rate (EBR) increased steadily from a baseline rate of 46 percent in January 2000 to 83 percent in the October 2001 RAP survey (figure 2). The greatest gains were made in the 4–5 month age group, where the EBR increased from 12 percent at baseline to 71 percent in 2001. The exclusive breastfeeding rate also increased during the vulnerable first month, from a baseline of 75 percent to 93 percent in 2001.

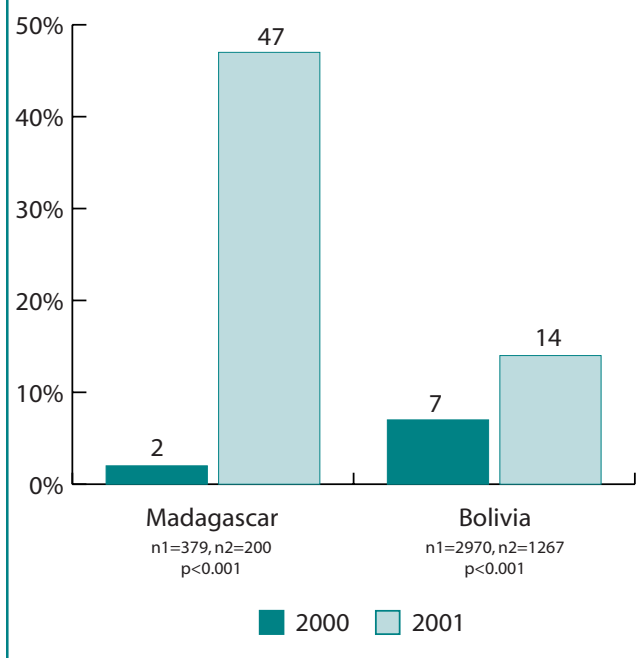


In the LINKAGES program areas in Ghana, the exclusive breastfeeding rate was 68 percent in 2000 and 78 percent in 2001. In Bolivia, although the change from baseline to the 2001 RAP survey was small (54 percent versus 56 percent), the sample sizes were large, and the change was statistically significant ( $p < 0.001$ ).

### The LAM rate increased 20-fold in Madagascar and doubled in Bolivia.

The LAM rate in Madagascar increased to 47 percent in 2001, up from a project baseline rate of 2 percent in 2000 (figure 3). Of women who practiced LAM, 43 percent went on to use another modern method at six months compared with 23 percent of those who did not practice LAM. In Bolivia the LAM rate doubled from the baseline in 2000 (7 percent) to the RAP 2001 survey (14 percent), indicating rapidly growing acceptance

Figure 3. LAM Rate (Madagascar, Bolivia)



of LAM as a contraceptive method in LINKAGES program areas.

In Jordan the focus has been on phased-in LAM training of all public, clinic-based maternal and child health service providers. Service statistics were analyzed to determine the LAM user rate—the proportion of *all women of reproductive age* who report using LAM as a means of child spacing. While this rate underestimates LAM use among only those eligible women with infants less than six months, it serves as a proxy for LAM use when the infant's age is not available. The LAM user rate among women who received services at the government's health centers increased dramatically over time, from 0.1 percent in 1999, to 0.5 percent in 2000, and to 4.5 percent in 2001. Due to the tendency of the LAM user rate to underestimate actual trends, this increase is more dramatic than it appears.

### Mixed feeding—a high-risk behavior—declined in the demonstration site in Zambia.

The Ndola demonstration project in Zambia was established initially to focus on infant feeding in six health centers and their seven catchment communities. The goal of the program was to enable women to make and act effectively on an informed choice to feed their infants optimally in the context of high HIV prevalence.<sup>2</sup> In the project site, both community-based and clinic-based surveys were conducted. From baseline data col-

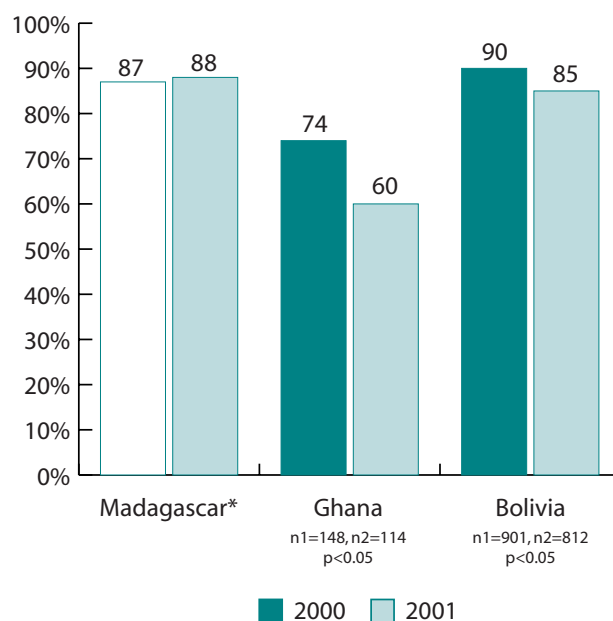
lected in the community in April 2000 to midterm data collected in April 2001, the exclusive breastfeeding rate of infants 0–<6 months—using the 24-hour recall measure—increased from 57 percent to 75 percent. The mixed feeding rate decreased from 42 percent to 25 percent. Initiation of breastfeeding within the first hour after birth increased from 53 percent to 83 percent in the community-based survey.

Women surveyed in the clinic reported higher exclusive breastfeeding and timely initiation rates than those surveyed in the community. Among women in the clinic, exclusive breastfeeding increased from 73 percent at baseline to 84 percent at midterm, and timely initiation of breastfeeding increased from 59 percent to 76 percent.

### Increasing the timely complementary feeding rate remains a challenge in all LINKAGES countries.

In Madagascar the timely complementary feeding rate remained steady (figure 4). Although the rate decreased in Bolivia and Ghana, the proportion of those who gave better quality complementary foods to their infants increased.

Figure 4. Timely Complementary Feeding (Madagascar, Ghana, Bolivia)



\* In Madagascar the timely complementary feeding rate was not measured until 2001. The 1997 DHS timely complementary feeding rate is, therefore, used as a point of comparison.

<sup>2</sup> The Zambia program is now an integrated model for the prevention of mother-to-child transmission of HIV. The goal is to reduce mother-to-child transmission of HIV and to ensure HIV-free child survival through integrating infant feeding counseling, voluntary counseling and testing (VCT), and antiretroviral prophylaxis into existing health and community services. The program serves 16 clinics and surrounding communities in four provinces.

## Measuring Progress

**M**easuring progress requires appropriate instruments to assess current feeding practices and monitor program impact. LINKAGES' approach to monitoring and evaluating its country programs includes the following activities:

**Baseline surveys:** Data are collected on key indicators and other program-related questions using large sample sizes to detect a small, yet significant change in behaviors. In some instances where Demographic and Health Survey (DHS) results are timely and available, DHS data serve as a baseline. Indicator targets are established based on baseline or DHS data.

**Rapid assessment procedure (RAP) surveys:** On an annual basis, LINKAGES collects data on key indicators using a shorter questionnaire and smaller sample sizes than those used for baseline and endline surveys. RAP surveys serve as a tool to quickly measure progress in achieving targets for key indicators and inform program management of areas that may need special attention. The RAP survey methodology employed by LINKAGES varies by country.

- ◆ *Bolivia:* Lot quality assurance sampling (LQAS) methodology was used so that each partner NGO would be able to assess results within their respective program areas.
- ◆ *Ghana:* Cluster sampling methodology was used with stratification by NGO to ensure representative results for each of the three NGO partners.
- ◆ *Madagascar:* Cluster sampling methodology was used. Communities included in the survey were not selected randomly from all possible communities in the program area. To assess appropriateness of program design, only communities in each of the intervention districts that were observed to be most actively promoting program strategies were included in the sampling framework.

**Endline surveys:** To evaluate the effectiveness of interventions, LINKAGES will undertake an endline survey at the end of a country program using large sample sizes and the same questionnaires used during the baseline survey. At the time this document was written, endlines had not yet been conducted in Bolivia, Ghana, or Madagascar.

**Special surveys:** LINKAGES occasionally conducts special surveys and studies to evaluate program activities. These include training evaluations, media evaluations, qualitative studies, and cost-effectiveness analyses.

Program results are compared with several data points depending on the local circumstances and data availability, including baseline surveys, survey results from control communities, Demographic and Health Surveys, Multi-Indicator Cluster Surveys, and data from other organizations working within or near LINKAGES program areas. Different sampling methodologies are used depending on circumstances in each country. For this reason, statistical comparisons across different countries are not made although comparisons across time within a country are made. Multistage cluster sampling is used in most countries, and depending on the particular needs of local clients and the specifics of the program, various levels of stratification and/or parallel sampling are included. In some countries control groups are also surveyed.

In Bolivia, because of the large number of individual NGO partners, LINKAGES trained each participating NGO in applying LQAS for monitoring and evaluation purposes. The NGOs were encouraged to use LQAS for their internal monitoring needs. However, during the period of LINKAGES' assistance, LQAS-based surveys were coordinated to take place simultaneously for all participating NGOs so that data could be aggregated to provide program-wide indicator rates.

## Lessons Learned Using Infant Feeding Indicators

LINKAGES' experience confirms that the more complex the feeding practice, the harder it is to change and measure. The challenges of evaluating infant feeding programs are summarized below.

**Infant feeding behavior data rely on precise age data.** While many health interventions can be tracked with only a general reference to the child's age (e.g., less than five years), tracking breastfeeding practices requires more precise assessment of the infant's age. The birth date a mother gives for her infant can be checked against a child health card or other official registry of the child's birth date.

**The use of 24-hour recall data overestimates the percentage of infants exclusively breastfed.** The exclusive breastfeeding rate should be interpreted as the percent of infants who received only breastmilk in the past 24 hours rather than the percent who have been exclusively breastfed since birth. In the 24 hours before the survey, a mother may have practiced exclusive breastfeeding but she could have fed her infant other liquids at another point in time. Despite its shortcomings, the advantage of this approach is that it is not subject to recall error because the recall period is limited to the previous 24 hours.

**A single complementary feeding indicator gives an incomplete picture of this complex feeding behavior.** The timely complementary feeding rate—an accepted, standard indicator—reflects general dietary intake of solid and semi-solid foods along with breastmilk during a specified time period. The indicator

does not, however, capture factors such as quantity and quality of food, frequency and timeliness of feeding, food hygiene, and feeding during/after illness. LINKAGES is working with the World Health Organization and other groups to define indicators that would measure these factors.

**Infant feeding questions typically require more interviewer time and training than “yes” or “no” questions.** Interviewers must ask respondents about a series of foods given within the previous 24 hours to calculate exclusive breastfeeding and timely complementary feeding rates. In recall questions, foods should be grouped into major categories to minimize interviewer fatigue and interviewee boredom with a long, detailed list of foods. Interviewers should undergo intensive training on infant feeding questions related to infant food groups.

**The LAM rate does not report on appropriate use of the method.** The LAM rate is based on a woman's indication that LAM is deliberately used as a method of family planning. As with other methods of family planning, no determination is made as to whether the woman who states she is using LAM meets the criteria for its use or can identify on her own the criteria for its use. LINKAGES does, however, capture additional survey data to determine whether a woman knows the criteria and currently uses LAM.

**A standard definition is needed for the term “mixed feeding.”** An internationally accepted definition will provide HIV prevention programs with an indicator to measure reductions in this high-risk behavior in early infancy.

### Related LINKAGES Publications

For copies, contact LINKAGES, or visit [www.linkagesproject.org](http://www.linkagesproject.org).

#### Experience LINKAGES

Program Approaches

#### World LINKAGES

Bolivia (2002)    Madagascar (2002)  
Ghana (2002)    Zambia (2002)  
Jordan (2002)

### Evaluation Reports

Guyon A, Rambeloson Z, Mulligan B. Assessment of the Behavior Change Strategy for Young Child Nutrition, Vaccination, and Family Planning: Antananarivo and Fianarantsoa, Madagascar. October 2001.

Horizons Program. Ndola Demonstration Project: A Midterm Analysis of Lessons Learned. Nairobi: Population Council, 2002.

MOH/LINKAGES, Adjei E, Schubert J. A Follow-up Survey on Breastfeeding and Complementary Feeding Knowledge and Practices in Northern Ghana. November 2001.

PROCOSI/LINKAGES. Monitoring of the PROCOSI/LINKAGES Breastfeeding and Complementary Feeding Program in Bolivia. October 2001.



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